

BIOSPHERE RESERVES IN INDIA

Biosphere Reserve - INTRODUCTION

- ⦿ Biosphere reserves are sites established by countries and at times recognized under UNESCO's Man and the Biosphere (MAB) Programme to **promote sustainable development** based on local community efforts and sound science.
- ⦿ An ecosystem with plants and animals of unusual scientific and natural interest.
- ⦿ *Areas of terrestrial and coastal/ marine ecosystems.*
- ⦿ Protection is granted not only to the flora and fauna of the protected region, but also to human communities who inhabit these regions, and their ways of life.
- ⦿ Concept of Biosphere Reserves **launched in 1971** as a part of United Nations Educational, Scientific and Cultural Organization (UNESCO)'s '**Man and Biosphere Programme**'.
- ⦿ The **National Biosphere Reserve Programme in India - initiated in 1986** - to serve a wider base for conservation of entire range of living resources and their ecological foundations in addition to already established protected area network system.

Aims & Functions of Biosphere Reserves

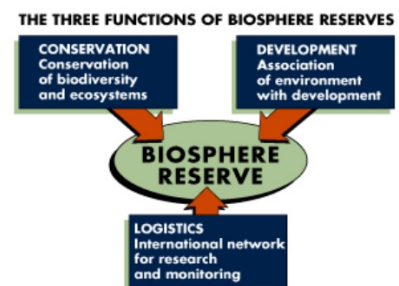
Aim - to get a balanced relationship between mankind and nature

Functions:

Conservation - of biodiversity and cultural diversity

Development - Economic development that is socio-culturally and environmentally sustainable

Logistics – supporting development through research, monitoring, education and training

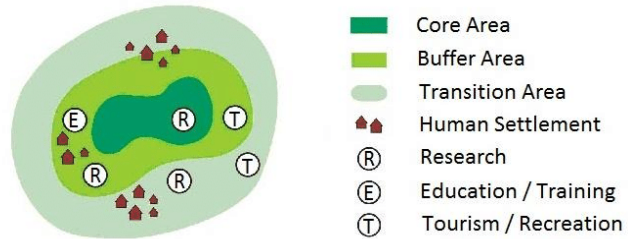


Zones of Biosphere Reserves

Core Area

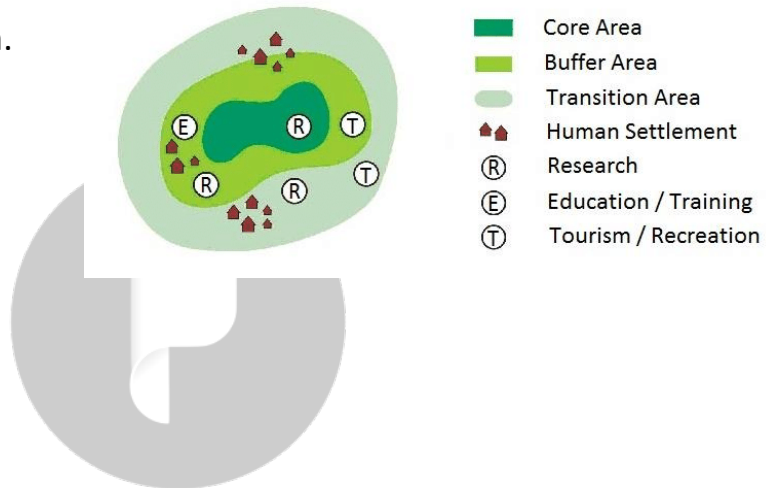
Buffer Zone

Transition Zone (Area of Co-operation)



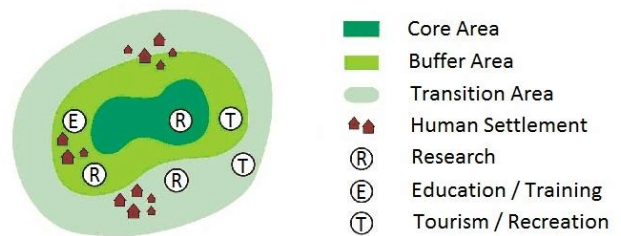
Core Zone

- It is the **innermost** undisturbed ecosystem.
- Legally protected area where **human intervention** is strictly **prohibited**.



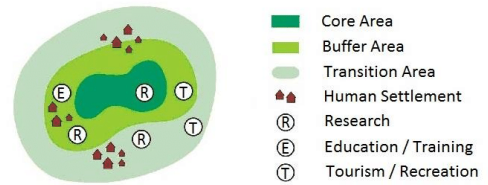
Buffer Zone

- Area **surrounding the core zone**
- Only **research and education** activities are permitted to humans. These activities should not obstruct the conservation objectives of the core area.
- It includes restoration, limited **tourism, fishing, grazing**, etc; which are permitted to reduce its effect on the core zone.
- Human activities are less intensive in this zone as compared to the transition zone.



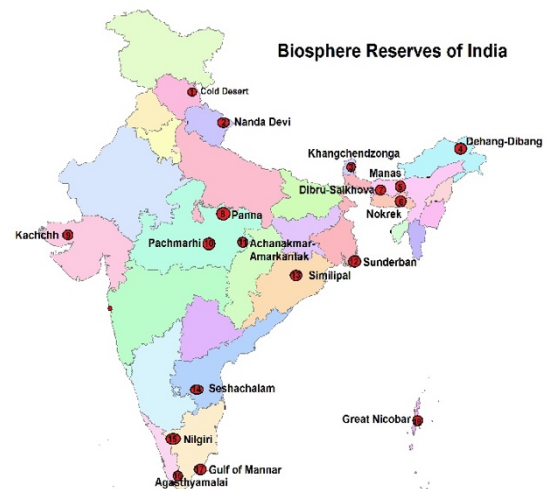
Transition Zone

- **Peripheral area** of a biosphere reserve
- **Zone of cooperation** where human ventures and conservation are done in harmony.
- Cropping, recreation, forestry, and **human settlements** are permitted



IMPORTANT FACTS

There are **18** Biosphere Reserves in India.
Of these, **12** are **part of the World Network of Biosphere Reserves**.



- ❖ **First BR:** Nilgiri Biosphere Reserve (1986) in Tamil Nadu, Kerala, Karnataka
- ❖ **Largest BR:** Gulf of Kachch in Gujarat
- ❖ **Smallest BR:** Dibru-Saikhowa in Assam



| S. No. | Name | States | Established | World Network of BR |
|--------|------------------------|-------------------------------|-------------|---------------------|
| 1 | Nilgiri | Tamil Nadu, Kerala, Karnataka | 1.08.1986 | Included (2000) |
| 2 | Gulf of Mannar | Tamil Nadu | 18.02.1989 | Included (2001) |
| 3 | Sunderbans | West Bengal | 29.03.1989 | Included (2001) |
| 4 | Nanda Devi | Uttarakhand | 18.01.1988 | Included (2004) |
| 5 | Simlipal | Odisha | 21.06.1994 | Included (2009) |
| 6 | Nokrek | Meghalaya | 1.09.1988 | Included (2009) |
| 7 | Pachmarhi | Madhya Pradesh | 03.03.1999 | Included (2009) |
| 8 | Achanakamar-Amarkantak | Chhattisgarh, Madhya Pradesh | 30.03.2005 | Included (2012) |
| 9 | Great Nicobar | Andaman & Nicobar Islands | 6.01.1989 | Included (2013) |

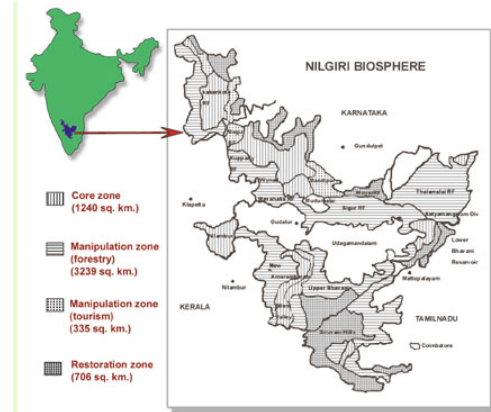
| S. No. | Name | States | Established | World Network of BR |
|--------|---------------------|-----------------------|-------------|---------------------|
| 10 | Agasthyamalai | Kerala and Tamil Nadu | 12.11.2001 | Included (2016) |
| 11 | Khangchendzonga | Sikkim | 7.02.2000 | Included (2018) |
| 12 | Panna | Madhya Pradesh | 25.08.2011 | Included (2020) |
| 13 | Manas | Assam | 14.03.1989 | - |
| 14 | Dibru-Saikhowa | Assam | 28.07.1997 | - |
| 15 | Dehang-Dibang | Arunachal Pradesh | 2.09.1998 | - |
| 16 | Great Rann of Kutch | Gujarat | 29.01.2008 | - |
| 17 | Cold Desert | Himachal Pradesh | 28.08.2009 | - |
| 18 | Seshachalam | Andhra Pradesh | 20.09.2010 | - |

1. Nilgiri Biosphere Reserve - 1986

- **World Natural Heritage Site**
- **Location** - Parts of Tamil Nadu, Kerala, Karnataka
- UNESCO designated it a biosphere reserve in 2000

☉ Protected Areas:

1. Mudumalai Wildlife Sanctuary (Also Tiger Reserve)
2. Wyanaad Wildlife Sanctuary
3. Bandipur National Park (Also Tiger Reserve)
4. Nagarhole National Park (Also Tiger Reserve)
5. Mukurthi National Park
6. Silent Valley



Nilgiri Biosphere Reserve - **Biodiversity**

Fauna - Nilgiri tahr, Nilgiri langur, Lion – tailed macaque

Rivers - Bhavani, Moyar, Kabini (tributaries of Cauvery), Chaliyar, Punampuzha, etc.

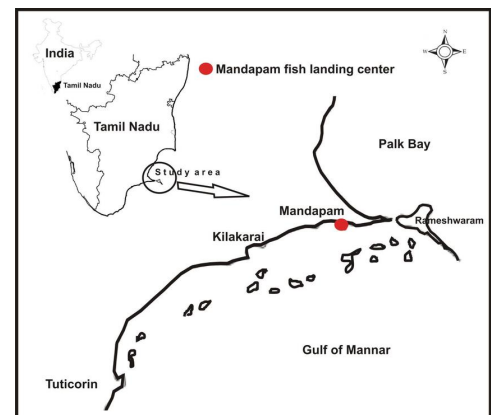


2. Gulf of Mannar 1989

- ☉ **First marine Biosphere Reserve in India**
- ☉ **Location** - Tamil Nadu (Indian part of Gulf of Mannar)
- ☉ Large shallow bay forming **part of the Laccadive Sea** in the Indian Ocean with least depth of 5.8 m (19 ft).
- ☉ The Malvathu Oya (Malvathu River) of Sri Lanka and the estuaries of Thamirabarani River and Vaippar River
- ☉ **Protected Area** –

Gulf of Mannar Marine National Park

UNESCO designated it a biosphere reserve in 2001



Gulf of Mannar Biodiversity

Sea Cow (dugong), Sea Anemone, sea cucumbers, Sea turtles



Dugongs

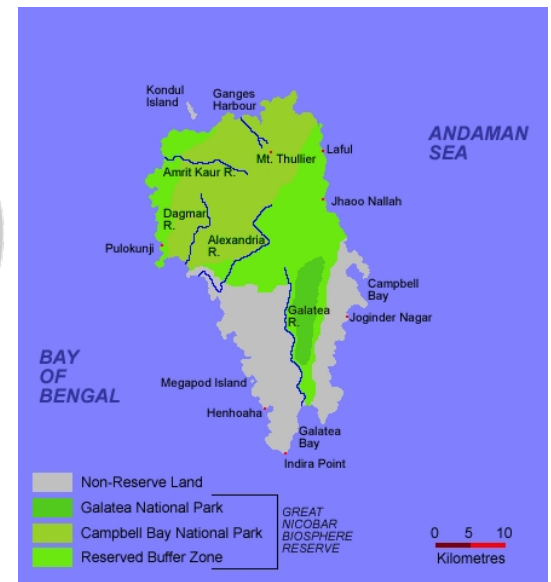


Sea Cucumbers



3. Great Nicobar Biosphere Reserve 1989

- ⦿ **Location** - Andaman & Nicobar Islands
- ⦿ Great Nicobar is the southernmost island of the Nicobar Islands Archipelago.
- ⦿ Encompasses a large part (some **85%**) of the island of Great Nicobar
- ⦿ Included in the list of Man and Biosphere program of UNESCO in 2013
- ⦿ **Protected Areas:**
 1. Campbell Bay National Park
 2. Galathea National Park



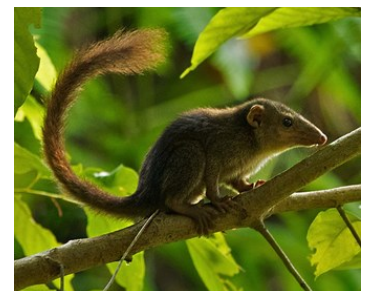
Great Nicobar Biosphere Reserve - Biodiversity



Nicobar long-tailed



Nicobar scrub fowl



Nicobar tree shrew



Salt water crocodile



Edible-nest

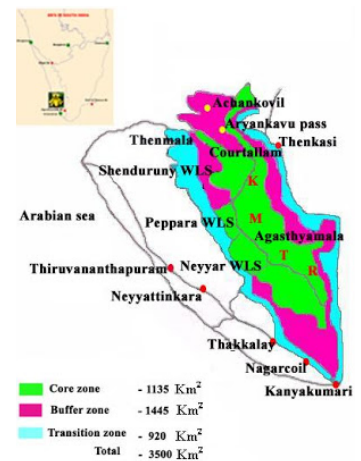
4. Agasthyamala Biosphere Reserve-2001

📍 **Location:** southernmost end of the Western Ghats in Kerala and Tamil Nadu

📍 **Protected Areas-**

- Shendurney Wildlife Sanctuary
- Peppara Wildlife Sanctuary
- Neyyar Wildlife Sanctuary
- Kalakkad Mundanthurai Tiger Reserve

📍 **Fauna-** Bengal Tiger, Asian Elephant, and Nilgiri Tahr.

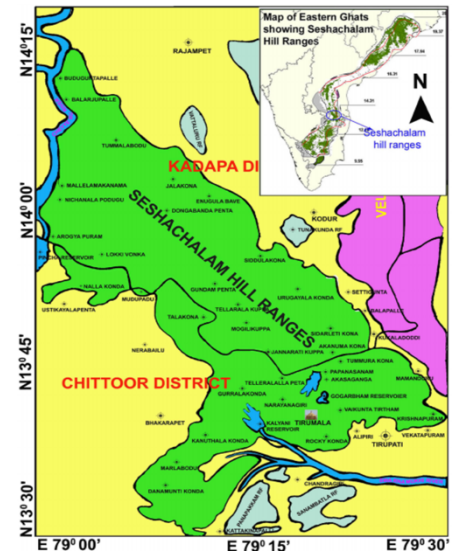


Part of the UNESCO World Network of Biosphere Reserves since 2016



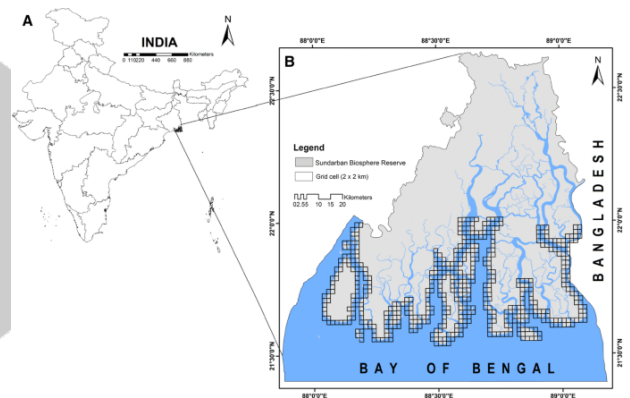
5. Seshachalam Hills Biosphere Reserve- 2010

- **Location** – Southern Eastern Ghats in Seshachalam Hill Ranges covering parts of Chittoor and Kadapa districts, Andhra Pradesh
- **Fauna** - Slender loris



6. Sunderban - 1989

- **World Natural Heritage Site**
- **Location** - Part of delta of Ganges and Brahmaputra river system in West Bengal
- Sunderban - largest continuous mangrove area (along with Bangladesh) in the world
- Spans from Hooghly River in West Bengal (India) to Baleswar River (Bangladesh).



- **Fauna** - Royal Bengal tiger
- **Protected Areas**
 - 1.Sundarban National Park /Sundarban Tiger Reserve
 - 2.Sajnekhali Wildlife Sanctuary
 - 3.Loathian Wildlife Sanctuary
 - 4.Haliday Wildlife Sanctuary



7. Simlipal Biosphere Reserve -1994

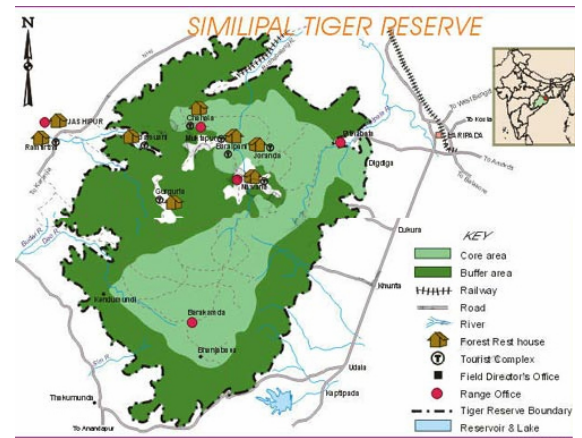
⦿ **Location:** Mayurbhanj district , Odisha

⦿ **Protected Areas-**

- Part of the Mayurbhanj Elephant Reserve
- Similipal Tiger Reserve
- Hadgarh Wildlife Sanctuary
- Kuldiha Wildlife Sanctuary

⦿ **Part of the UNESCO World Network of Biosphere Reserves since 2009**

⦿ *The biosphere reserve has the largest zone of Sal in all of India*



Simlipal Biosphere Reserve -Biodiversity

⦿ **Fauna-** Bengal tiger, Asian elephant, gaur, and chausingha



8. Achanakmar-Amarkantak Biosphere Reserve -

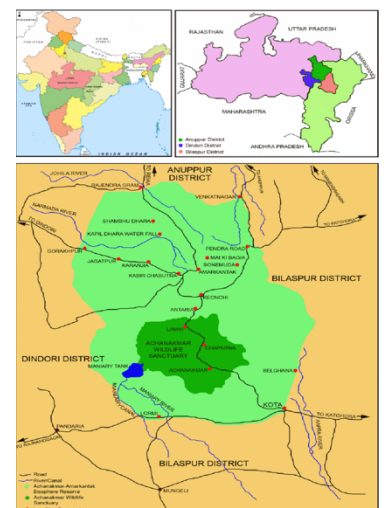
⦿ **Location:** Madhya Pradesh and Chhattisgarh

⦿ Bilaspur district (Chhattisgarh), Anuppur and Dindori (Madhya Pradesh)

⦿ **Protected area** - Achanakmar Wildlife Sanctuary

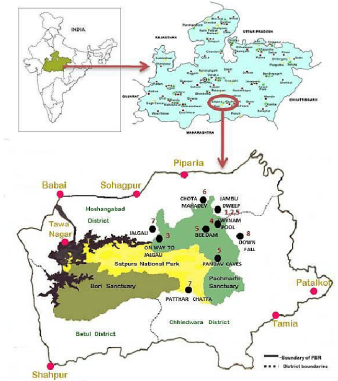
⦿ **Fauna** - Four horned antelope, Indian wild dog, Saras crane, Asian white-backed vulture, Sacred grove bush frog.

Part of the UNESCO World Network of Biosphere Reserves since 2012



9. Pachmarhi Biosphere Reserve - 1999

- ⦿ **Location:** Satpura Range of Madhya Pradesh
- ⦿ Satpura mountain ranges cross India from west to east and Pachmarhi lies directly in its centre
- ⦿ **Protected Areas:**
 - Bori Sanctuary
 - Pachmarhi Sanctuary
 - Satpura National Park
- ⦿ **UNESCO designated it a biosphere reserve in 2009**



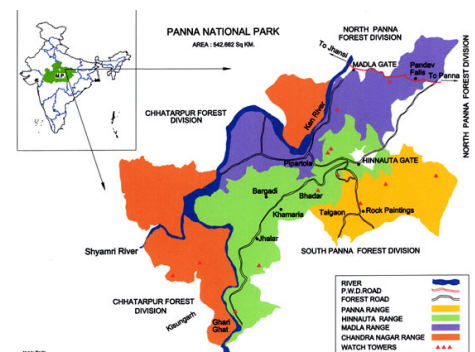
Pachmarhi Biosphere Reserve – Biodiversity

- ⦿ **Rare & Endangered Fauna** - Giant Squirrel and Spilornis cheela (Crested serpent eagle)



10. Panna Biosphere Reserve- 1981

- ⦿ **Location:** Vindhya Mountain Range in Panna & Chhatarpur districts of Madhya Pradesh
- ⦿ **Ken River** (tributary of Yamuna) flows through the reserve
- ⦿ **Ken-Betwa river interlinking project** will be located in it
- ⦿ **Protected Areas –**
 - Panna National Park
 - Ken Gharial Wildlife Sanctuary



Part of the **UNESCO World Network of Biosphere Reserves** since 2020

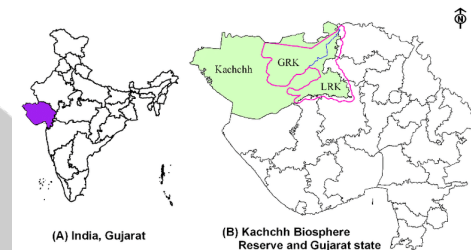
Panna Biosphere Reserve - Biodiversity

- ☉ Tiger, leopard, chital, chinkara, nilgai, sambhar and sloth bear
- ☉



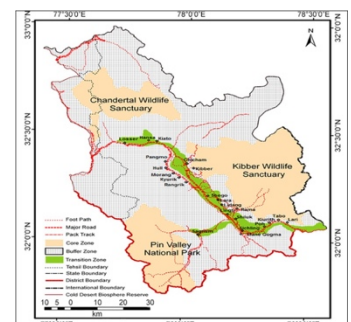
11. Great Rann of Kutch Biosphere Reserve- 2008

- **Location**- Part of Kutch, Morbi, Surendranagar and Patan districts (Gujarat)
- Largest biosphere reserve in India
- Fauna - Indian wild ass



12. Cold Desert Biosphere Reserve- 2009

- **Location** : Western Himalayas region in Himachal Pradesh
- **Protected Areas**:
 - Pin Valley National Park
 - Chandratat Wildlife Sanctuary
 - Sarchu Wildlife Sanctuary
 - Kibber Wildlife Sanctuary
- **Fauna**- Snow leopard

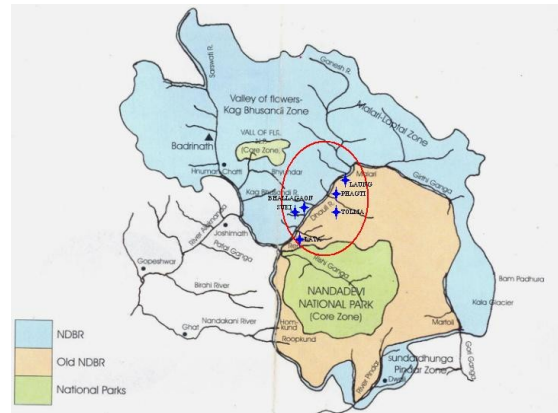


13. Nanda Devi Biosphere Reserve 1988

- ⦿ **World Natural Heritage Site**
- ⦿ **Location** - Uttarakhand
- ⦿ **River** - Rishi Ganga
- ⦿ **Protected Areas:**

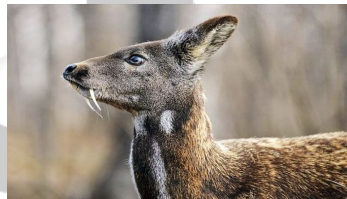
1. Nanda Devi National park
2. Valley of Flowers National Park

UNESCO designated it a biosphere reserve in 2004



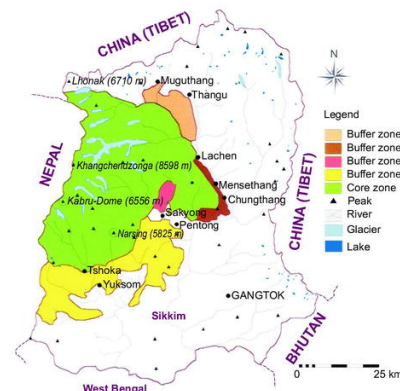
Nanda Devi Biosphere Reserve - **Biodiversity**

Endangered mammal species - Snow leopard, Himalayan black bear, brown bear, Musk deer (State animal of Uttarakhand) and bharal/blue sheep



15. Khangchendzonga Biosphere Reserve- 1977

- ⦿ **Location:** Sikkim
- ⦿ UNESCO World Heritage Sites in 2016, becoming the first "**Mixed Heritage**" site of India
- ⦿ The site is one of the world's 34 **biodiversity hotspots**.
- ⦿ Part of the **UNESCO World Network of Biosphere Reserves** since 2018



Khangchendzonga Biosphere Reserve- Biodiversity

- ☉ Musk deer, snow leopard, Himalayan tahr, dhole, sloth bear, viverrids, Himalayan black bear, red panda.



Himalayan tahr



Dhole



Red Panda



Viverrids

15. Manas Biosphere Reserve - 1989

- ☉ UNESCO Natural World Heritage site
- ☉ National park, a Project Tiger reserve, an elephant reserve and a biosphere reserve
- ☉ **Location** - Assam
- ☉ **River** - Manas-Beki



Manas Biosphere Reserve Biodiversity

- ☉ Assam roofed turtle, hispid hare, golden langur and pygmy hog.
- ☉ Manas is famous for its population of the wild water buffalo



pygmy hog



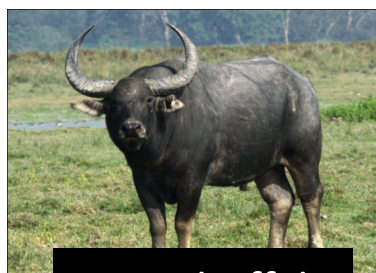
Assam roofed turtle



hispid hare



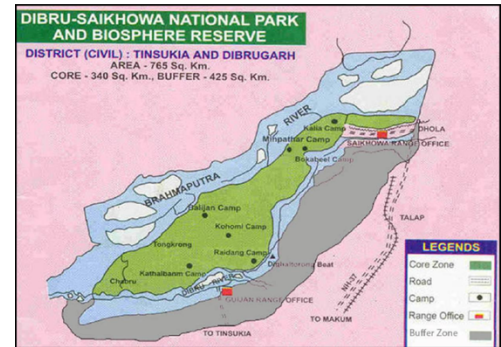
golden langur



water buffalo

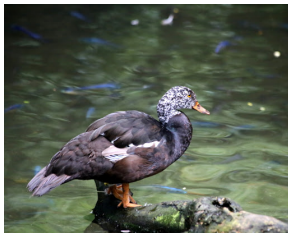
16. Dibru-Saikhowa Biosphere Reserve- 1997

- **Location** - Part of Dibrugarh and Tinsukia district, Assam
- **Smallest** of all BR
- Bounded by the Brahmaputra and Lohit Rivers in the north and Dibru river in the south
- **Largest salix swamp forest** in north-eastern India with a tropical monsoon climate with a hot and wet summer and cool and usually dry winter

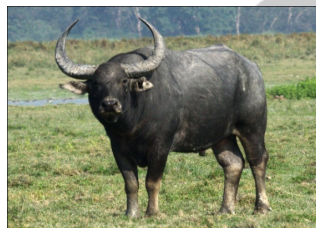


Dibru-Saikhowa Biosphere Reserve- Biodiversity

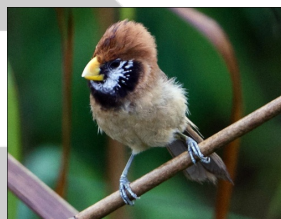
- White-winged wood duck, water buffalo, black-breasted parrotbill, tiger, capped langur



White-winged
wood duck



water buffalo



black-breasted
parrotbill

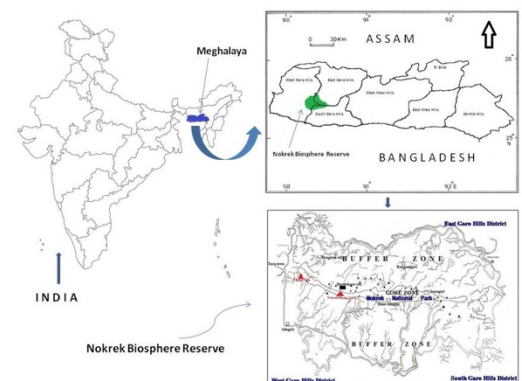


capped langur

17. Nokrek Biosphere Reserve- 1988

- **Location** – on Tura Range, Garo Hills, Meghalaya (Nokrek is the highest peak of the Garo hills)
- **Rivers** - Ganol, Dareng and Simsang
- 90% of the Reserve is covered by evergreen forest
- **Protected Area** - Nokrek National Park

UNESCO designated it a biosphere reserve in 2009



Nokrek Biosphere Reserve- **Biodiversity**

Asian elephant, Giant flying squirrel, Pig-tailed macaque, Hoolock gibbons (most endangered apes in India)



Asian elephant



Hoolock gibbons



Pig-tailed macaque



Giant flying squirrel

18. Dihang-Dibang Biosphere Reserve - 1989

Location – district of West Siang, Upper Siang and Dibang valley of Arunachal Pradesh

◎ **Protected Areas** –

- Mouling National Park
- Dibang Wildlife Sanctuary

◎ **One of the world's "Bio-Diversity Hot spots"**



Dihang-Dibang Biosphere Reserve Biodiversity

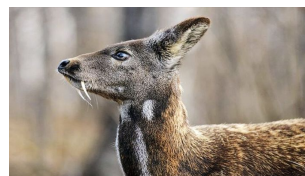
Mishmi takin, red goral, musk deer, red panda, Gongshan muntjac



Mishmi takin



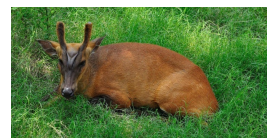
red goral



musk deer



red panda



Gongshan muntjac